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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •

MARCH 6, 1937

New Employment

See Page 150

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The Weekly Summary of

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DO YOU KNOW?

Moscow has a new museum of architecture.

Electric brooders are being used to raise young pigs in winter and early spring.

Thousands of trees are to be planted in England this year to commemorate the coronation of King George VI.

A new German process for making colored films is an attempt to solve the problem chemically, rather than optically.

Engineers are seeking a material for airplane windshields that will withstand the impact when a bird crashes against the shield.

A survey of what it costs to drive farm motor trucks in various kinds of country has been made by the U.S. Bureau of Agricultural Economics.

The grizzly bear got this name from a description given by Capt. Lewis of the Lewis and Clark Expedition, which brought the animal to scientific notice.

The French postal system now aims to see that letters posted in the evening for any part of the country will be delivered next morning, even if this requires airmail service given without extra charge.

Not many farmers realize that salt will poison hogs, if fed in too large quantities.

Levees were built on Mississippi River banks as early as 1717, at New Orleans.

The nineteenth-century clipper ship has been called one of the earliest experiments in streamlining.

Ancient people had mirrors of polished metal, but glass mirrors were not produced until the eleventh century.

A new kind of plastic is strong, yet so crystal clear that it is possible to see through a cylinder of it ten inches thick.

To warn motorists of approaching curves or crossroads, painted center lines along a road are being made wavy at such points.

A "Chinese First Reader" for study of the language has been prepared with only 500 characters, by a Chinese student at the University of California.

Government scientists find that flies reared in laboratory cages are tougher and harder to kill with chemical fly sprays than wild flies; so that a spray that dispatches "tame" flies is likely to be effective in general use.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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METEOROLOGY

To Probe the Upper Air In New Study of Weather

New England, Area Unexplored as a Weather-Breeder, Will Receive One Month's Intensive Investigation

AN INTENSIVE, one-month investigation of weather conditions in the upper air, the first comprehensive study of its type ever attempted on the intricate vagaries of notorious New England weather, has been inaugurated by Harvard and Massachusetts Institute of Technology scientists, who are sending aloft the first of a series of radio meteorographs, a combined flying weather observatory and radio broadcasting station.

The aim of the project is to obtain a complete record of temperature, humidity and air pressure from the earth up into the stratosphere and thus shed more light on the forecaster's problem of how weather is "manufactured." New England was chosen for the research because of this area's interest to meteorologists as an unplumbed weather-breeder.

Recognizing the importance of taking daily sections of the weather, M.I.T. and Weather Bureau investigators have conducted airplane flights for the past six years, gathering much valuable information through these flights.

In fog or snowy weather, however, when such information is most desired, airplane ascents have been too hazardous and it was to eliminate this loophole that the balloon-lifted weather stations were developed. They also have the added advantage of easily tripling the 20,000-foot airplane ceiling and thus reaching the really important heights in weather-formation. In preliminary tests, for example, one instrument reached the amazing height of 71,000 feet, well into the puzzling stratosphere and just below man's all-time ascension record.

How far the first balloon went is not known, for the automatic signals of the miniature transmitting apparatus were only followed as high as 25,000 feet. At that time a temperature of 40 degrees below zero Fahrenheit was recorded, in comparison with 24 degrees atop the Guggenheim Laboratory at Technology where the balloons were released.

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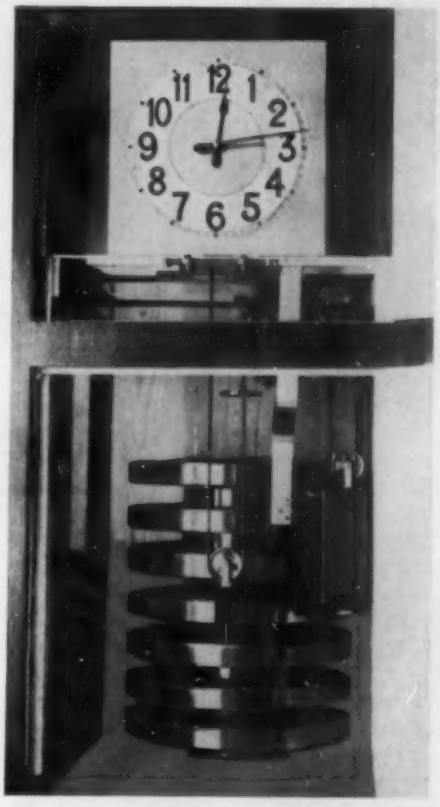

RUNS WITHOUT WINDING

For over 20 years the clock shown above has run without winding. In November, 1916, it was set in operation in the town of Orebro in central Sweden, and has run continuously on the power derived by changes in the barometric pressure of the atmosphere. Essential parts of the clock mechanism are seven metal boxes that are moved by the pressure. This movement raises the weights which run the clock. The power needed is estimated at one-millionth of a horsepower.

PLANT PHYSIOLOGY

Plants, Like Children, Have Finicky Appetites

SOME PLANTS, like some children, have finicky appetities. And like the spoiled brats, they refuse to eat unless coaxed. There isn't any way to spank them.

Prof. Lyman G. Schermerhorn, of the New Jersey Agricultural Experiment Station, blames just such a cause for hitherto unexplainable failures of certain vegetable varieties to produce their best crops under orthodox cultural methods.

Nutritional requirements of plants are just as various as those of animals, he observes in reporting that plant feeding experiments undertaken a year ago have already supplied many clues to solve the mystery of reduced yields.

"Each variety of a vegetable group requires different feeding," Prof. Schermerhorn points out, "and we'll have to learn how to feed them as varieties, catering to their whims regarding fertilizer preference and the exact time when a given variety of plant seems to want and need nutrition."

For example, he makes clear that plant feeding tests have already determined that large applications of nitrogen to different varieties of lima beans did not perceptibly increase the yields of the small varieties, but greatly increased the production of large-seeded limas. Tried on tomatoes, one popular variety was found to respond best to heavy doses of fertilizer early in the season, while another variety produced best only when fertilized after its fruit started to set. Growers have always fed both varieties alike, Prof. Schermerhorn said.

The scientist predicted that "after the farmer learns to recognize that he can't feed all vegetable varieties alike, a great deal of confusion that now exists in the seed trade will be eliminated because the number of varieties will have to be reduced."

Improper plant feeding may even be so far-reaching as to cause the germination disorders in beans and other seeds which perplex both farmers and seedsmen, Prof. Schermerhorn suggested. Just like human beings, plants which are vigorous and healthy as the result of proper nutrition are more resistant to disease and frost, he said.

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PHYSICS

Sound Waves Prevent Smoke Belching From Chimneys

New Process Developed by Bureau of Mines Scientist Is Inexpensive Enough to Apply to Small Factories

UNFORTUNATELY the smoke-belching chimneys of industry denote the return of prosperity. Not that anyone believes prosperity as evidenced by renewed industrial activity is unfortunate; only the fuming chimneys. All too little realized still is the fact that smokeless chimneys can also be a mark of business and that it is not necessary to pollute the air man breathes to earn dollars by manufacturing.

Ever since soft, or bituminous, coal was discovered on the English seashores where the waves laid bare deposits—and the coal was called sea cole—the smoke nuisance has been literally on top of every busy community. Back in 1257 Henry III, the then King of England, had a moving day. His wife Eleanore removed from Nottingham to Tutbury Castle owing to the "unendurable smoke of the sea-cole."

Then as now commissions were appointed to study the problem but over 400 years later in 1661 John Evelyn wrote about the "hellish cloud of sea-borne coal which maketh the city of London resemble the suburbs of Hades."

Dr. E. R. Weidlein, president of the American Chemical Society and director of Mellon Institute for Industrial Research in Pittsburgh, Pa., has said:

"One of the biggest problems we are facing is the smoke nuisance. Smoke does not have a single saving grace. It is injurious to health. It is expensive in that it means fuel waste, high laundry bills, defacement of expensive buildings and lessened working capacity. Experts declare that throughout the United States smoke costs each inhabitant $16 annually.

Air Hygiene

Dr. Weidlein ought to know, for his laboratory was the source from which has sprung the newly organized Air Hygiene Foundation which is now in the forefront of smoke fighting in America.

It is a long way from Henry III's Queen Eleanore in both time and distance to Washington, D. C., in the year 1937, but recently the U.S. Bureau of Mines demonstrated a method of ridding chimneys of dust and smoke particles by the use of sound waves. The development because of its cheapness strikes at one of the most potent sources of industrial smoke—the small factory.

Developed by H. W. St. Clair, scientist from the Bureau's laboratories in Minneapolis, Minn., the precipitation of chimney smoke by sound truly works a seeming miracle. In his recent demonstration Mr. St. Clair filled a five-inch diameter glass tube with thick white smoke. Then he turned into the tube the sound waves of a high-pitched note of 7,000 vibrations a second. And at once the smoke particles began to cluster in striated levels down the length of the tube and wandered off to the walls and fell to the bottom.

Given to Public

The idea behind the method, for which patents have been applied (to be turned over free for the benefit of the public), is the simple experiment which everyone who has ever taken a course in physics must have performed.

Remember the long glass tube on the inside of which you sprinkled that yellowish, brown powder. How you put a stopper at one end and inserted a plunger device at the other. Then you applied rosin to the metal rod of the plunger and pulled a rag over it and created a shrilling sound of high pitch.

Immediately the brown powder—it was probably cork dust—danced up and down in the tube and gradually settled into certain spots just the length of the sound wave apart. The intervening spaces cleared up and became rid of the dust.

In that experiment, whether you remember it or not, you generated standing waves of sound that bounced back and forth in the tube from one end to the other and created regions where there was a maximum amplitude of sound wave vibration called anti nodes and then, alternately, regions where there was a minimum of vibration, called nodes. The experiment showed that the dust was kicked out of the anti node areas and deposited in the nodal region.

The St. Clair experiment with smoke precipitation uses this long known phenomenon except that the standing sound waves run vertically up and down the smoke stack, instead of horizontally. In actual practice the smoke and flue gases would be run in at the bottom on the side of the chimney and come out at the top, also on the side. And all the while the sound waves bounce up and down in the stack to precipitate out the particles.

Tried Out

Mr. St. Clair's method of smoke particle precipitation is completely in the experimental stage in America, but small pilot plant operations have been tried out in Germany in the past year or two. What success it will have, if and when it goes into real commercial operation is something which cannot be answered at the present time.

The first question which any one acquainted with the field of smoke stack flue particle recovery is, "How does it compare in effectiveness with the Cottrell electric method and also in cost of installation and maintenance?"

BATTLING SMOKE

In this experimental tube, H. W. St. Clair, U. S. Bureau of Mines scientist, demonstrated his new method for precipitation of smoke.

This well-known and widely used technique, developed by Dr. Frederick G. Cottrell of Washington, D. C., uses a powerful electrostatic field to attract the particles in the smoke which it is desired to remove. But its sizable cost of installation (getting proper electrical insulation and protection runs into money) has limited the number of Cottrell units throughout the world to hundreds only. For an effective reduction of the smoke nuisance thousands of installations would be required in the small industrial plants which now feel they cannot afford the costlier equipment.

Not for Fog

The answer to the question on the relative merits of the Cottrell and St. Clair methods is that one has to know something about the cheapness of a real installation and not merely a laboratory demonstration model. It seems as if the St. Clair method might be cheaper but no one yet really knows.

At the recent demonstration of St. Clair's device in Washington, Dr. Cottrell was asked what the possibility might be of using the system of sound waves to clear fog from an airport and the idea that enemy smoke screens in time of war might effectively be dispelled by the method. He smiled and shook his head. No.

The system, he indicated, relies on the use of standing waves to bring about the clearing phenomenon. It works nicely inside a tube or chimney but to try it on an airport would be most difficult in that the sound waves would spread in all directions, including upward, and so much of their energy would be lost. As for using the device in wartime, Dr. Cottrell merely pointed out that if the enemy would let you set up a large reflecting surface behind their lines you might have hope of creating some standing waves and dispelling their smoke screens.

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DOWN IT GOES

As a high-pitched sound is originated when the bulb is pressed, the dust collects in layers and then falls to the bottom of the chamber.

PHYSICS

Sticks to Old Viewpoint to Interpret Transmutation

Professor Bohr Surprises Physicists With Idea That Nucleus Has Temperature and Use of Thermodynamics

INTERPRETING the transmutation of the elements, by the changing of their atomic nuclei, must be considered from the old statistical point of view of thermodynamics rather than exclusively by the newer quantum theory, said Prof. Niels Bohr of the Institute of Theoretical Physics at Copenhagen, speaking at the meeting of the American Physical Society.

Prof. Bohr, one of the world's great physicists, is a past winner of the Nobel Prize and best known for his atomic model called the Bohr atom. This model and the relatively simple theory which produced it are no longer used in the front rank of thinking on atomic problems, but at the time of its inception more than 24 years ago it was a major forward step in science.

Prof. Bohr believes that modern atomic theories which treat the behavior of individual atoms, particles and nuclei are bound to fail when used on heavy atoms like lead which contain over 200 protons and neutrons in the nucleus. One must, he indicated, revert to the well-known laws of thermodynamics which have been used for 100 years to treat physical phenomena where a large number of particles are involved.

In barest outline Prof. Bohr examines, mathematically, a heavy atom like lead, forgets its individual internal particles and treats it as though it were a tiny drop of water or mercury with a myriad of particles in it. Such a theoretical droplet of nucleus would have such an enormous density that if it were as large as one cubic centimeter, its weight would be over 100,000,000 tons.

Under normal conditions, Prof. Bohr shows, the tiny droplet may be thought of being at a fairly low temperature.

During experiments in which such a nucleus is bombarded with neutrons, however, the first effect of the impact is to raise the effective temperature to the inconceivably high level of some 50,000,000,000 degrees Centigrade.

At such temperatures the particles within the nucleus, suggests Prof. Bohr, go into a state of violent thermal agitation. Some of the nuclear particles will "evaporate" and be hurled off with energies amounting to several million volts.

As soon as excess energy is liberated in this fashion the nucleus will "cool" down to lower temperatures and the evaporation will cease. Any residual energy will be radiated in the form of gamma rays until the nucleus has cooled to its normal temperature.

The main point of Prof. Bohr's new thinking on atomic physics which interests and even shocks some physicists is the idea that a nucleus can be thought of as having a temperature and that the evaporation of particles can be treated by thermodynamics.

By making detailed calculations based upon this idea Prof. Bohr was able to explain a number of phenomena which have been observed to take place when atoms undergo transmutation from one kind to another. In carrying out his calculations Prof. Bohr finds it necessary to use some of the ideas inherent in the more modern quantum mechanics. There is little doubt that the new Bohr theory, if proved successful, will be quickly accepted and welcomed by all physicists.

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ENGINEERING

Machine-Made Jobs

Labor-Saving Improvements Are Creating Opportunities As Well as Crowding Some From Old Employments

By WILFRED OWEN

See Front Cover

EVER since man created machines to multiply his powers of production there has been divided opinion regarding the effects upon employment which follow the adoption of technological improvements. With equal fervor the machine is blamed for unemployment and praised as the agent of our economic supremacy, and while the prophets of calamity see industrial salvation only in their land of Erewhon, Utopians joyfully measure production to infinity.

The fact remains, however, that while machinery may and often does displace the laborer, it also has the power of creating employment, and net effects are always dependent on particular circumstances, many of which lie beyond the machine.

When the electric refrigerator began to bar the ice man from America's back doors, many a disciple of the "good old days" lamented his passing. They overlooked the fact that electric refrigeration had joined the industrial roll call, creating new employment and new purchasing power, and that the marketing of this new machine was stimulating a demand for ice. By 1930 the number of ice dealers had increased 237 per cent over the census of a decade before.

Clerical Work

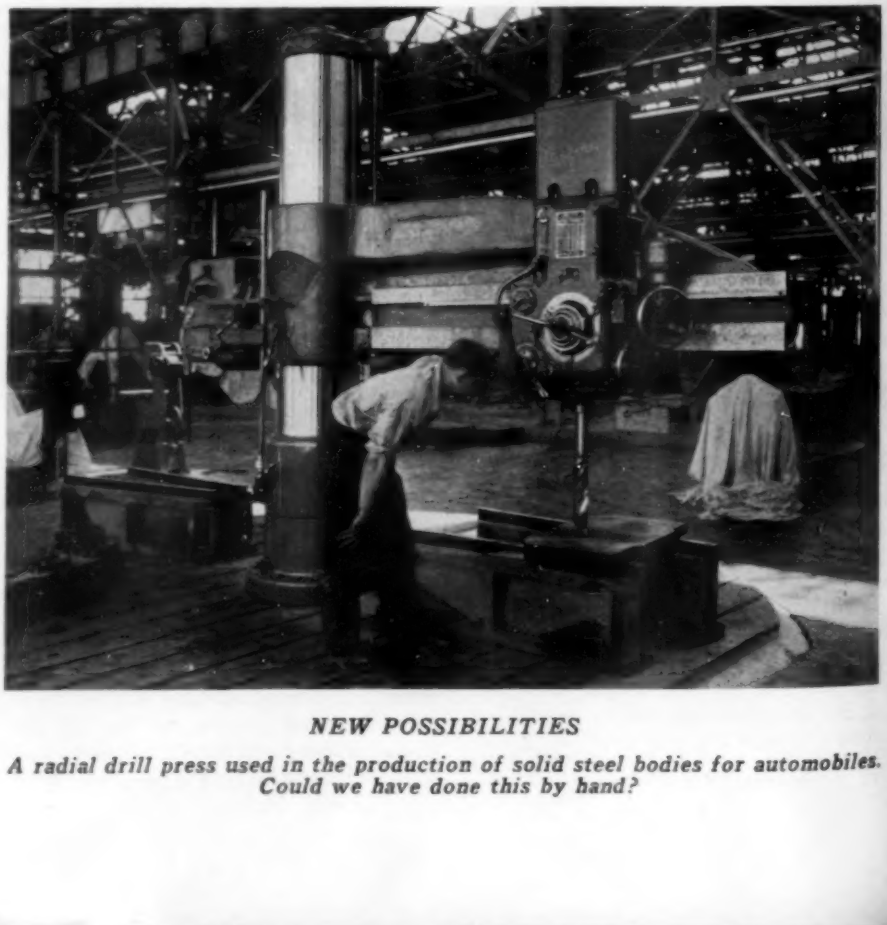
A number of such examples have been pointed out by the Machinery Institute to illustrate the possibilities of technological improvements in the creation of employment and prosperity. The modern office building, for example, is alive with the lesser monsters of a mechanized age: dictaphones, calculators, typewriters, and other labor-saving devices. It might be supposed that such equipment as this would mean sharp reductions in the office force. In reality it has made possible an amount of clerical work which could never have been attempted by unassisted labor, and in the period from 1920 to 1930 the total number of persons working as typists, stenographers, bookkeepers, cashiers and accountants had increased by 392,000. Large-scale business built by machinery has made such workers a necessary part of the industrial structure, and a mechanized office has become the offspring of dynamo and power loom.

A well-known iron monster is the steam shovel which digs and lifts and loads materials that armies of men might be doing by hand; and we readily deplore, without thinking, the numbers of workers who no longer dig for a living. But the steam shovel, while it has admittedly displaced this type of unskilled labor, has at the same time made possible a program of industry which might never have been dreamed of had men and their shovels been required to build its foundations. The steam shovel, which has opened the earth for endless roads and towering skyscrapers, has created a tremendous new demand for raw materials, public works, transportation, and plant construction, employing a tremendous succession of workers from miners and lumbermen to steel workers, masons, carpenters, riveters, and a host of others. Without the power of this single machine how could we create such a demand for the products of other industries?

Printing

Printing is another industry which employed hand labor to a large extent some forty years ago. With reductions in the cost of printing which followed the introduction of machinery, the price of reading matter became a minor issue, and demand for the printed word soared to such heights that despite the increased output per laborer made possible, the total number of such workers has become five times as great as it was in 1890. The effects felt by the lumber and paper business, moreover, and on mechanics, newsdealers and writers are not to be overlooked.

When the dial telephone was installed on less than three per cent of the Bell system in 1921, there were 190,000 operators asking us, number please? By



NEW POSSIBILITIES

A radial drill press used in the production of solid steel bodies for automobiles. Could we have done this by hand?

NOT FORGOTTEN

There are machine-made jobs in industry for women, too—occupations undreamed-of before the coming of the modern era. Operating the "fadeometer," which tests the resistance of fabric colors to the bleaching action of light, is one of the skilled occupations requiring a considerable degree of training.

1930, with 32 per cent of the system on dial service, the telephone girls we had thought might disappear altogether numbered 249,000. Telephone calls had increased more than 100 per cent, at the same time nearly doubling the need for both telegraph and telephone linesmen.

Auto Brings Jobs

A prime example of the beneficial effects upon the labor market which may be realized by the introduction of machinery and mass production is the automobile. Had it been impossible to attain our present labor-saving technique in the manufacture of motor vehicles, it would be difficult even to visualize the 28 million we now possess. It is reported that in 1935 six million persons depended either directly or indirectly upon the highway and motor vehicle industries for their livelihood—one out of every seven gainfully employed. In 1931 there were approximately a million men engaged in the building of roads, and two and a half million truck, taxi, and bus drivers, and private chauffeurs. The purchasing power created by these tremendous new industries is tremendous. The automobile is the largest consumer of rubber, mohair, plate glass, lubricating oil, gasoline, nickel, lead and steel. Our use of this latter product has increased from 2,600 pounds per capita in 1900 to 16,800 pounds in 1935. Such are the salutary signs of machine-made industry.

We have purchased more clothing than ever before since machinery made possible its production at lower cost, and though but a fraction of the human labor formerly required is now employed per unit of goods, demand has so increased with lower prices that almost a third more workers are making women's clothing today than ten or twelve years ago. For every seven persons engaged in the manufacture of men's furnishings between 1923 and 1925 there now are eight. The textile industry, according to the National Industrial Conference Board, was on the whole providing more employment per unit output in January 1936 than in the same month of 1929. Who would return to the spinning wheel?

Displacement Too

Nevertheless, to conclude from these examples that machinery never causes permanent displacement of labor would be as far from the truth as to assert that economic ailments are the inevitable result of technological innovation. The classical theory that labor-saving devices cause only a short-run period of unemployment is not always substantiated by the facts, for lower unit costs made possible by machine processes will not increase demand when the conditions of demand are inelastic.

Demand May Be Constant

For example, if some necessity of life, such as bread, were produced and sold at half its present price by the use of improved machine methods, there would be little increase in the amount of bread consumed. It is true that purchasing power thus released might be used for the buying of some other product, but only by those with restricted incomes whose demand for other things has been hitherto limited. And such releases of consumer spending would in all probability be distributed over so varied a number of goods that no one industry would necessarily need to increase its labor force to meet the added demand. The permanently displaced baker would not be reemployed as a result of the technological improvements in his industry. Such is the case with the introduction of mechanized farming equipment.

Another factor to be considered with regard to displacement of labor, either temporary or permanent, is the decrease in consumer spending when workers lose their jobs. We are so intent upon the supply side of the economic equation that we too often forget that production cannot be profitable when consumption cannot keep pace, and that the wage earner is the consumer.

Sometimes Elastic

Suppose, on the other hand, that our technological improvement is applied to an industry whose product is sold under conditions of elastic demand, that is, a demand sensitive to changes in price. Clothing, gasoline, moving pictures, and choice types of foods might be mentioned as examples. Reductions in price effected by the lower unit costs of machine production might attract sufficient new purchases to actually increase the labor force required. The effect on the labor market, of course, is not restricted to the particular product in question, for machinery must be manufactured and raw materials supplied, with the result that increased consumer demands will affect business activity throughout the entire productive process. (*Turn to page* 154)

PLANT PHYSIOLOGY

Texas Summer Heat Makes Seedless Tomatoes

SUMMER heat in Texas, preventing pollen from completing its fertilizing function on the flowers, is apparently responsible for the regular production of seedless tomatoes in the field. So suggests Leslie R. Hawthorn, horticulturist at the Texas Experiment Station, (*Science*, Feb. 19).

Mr. Hawthorn was interested in the question by the announcement by Science Service of Dr. Felix G. Gustafson's recent experiments at the University of Michigan, in which pollen extracts and other growth-stimulating substances caused various plants, including tomatoes, to set and mature seedless fruits.

A new hybrid tomato variety developed at the Texas Experiment Station, Mr. Hawthorn states, has overcome the reluctance of ordinary large-fruited tomatoes to set fruit in Texas hot weather. Its fruits contain seeds in June and usually in early July but with the coming of higher midsummer temperatures they become seedless. Only once in a while will one of these tomatoes contain a seed. In November, the tomatoes again become seed-bearing. During this seedless period the plants set and mature as many fruits as usual, and their quality is good.

"In view of Dr. Gustafson's experiments," concludes Mr. Hawthorn, "it would seem that possibly the substances necessary for fruit formation are stimulated to develop under these Southwestern conditions."

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PALEONTOLOGY

Caveman Animals Kept In Neandertal Refuge

WISENT, wild horses, reindeer, and other game animals that Neandertal Man hunted for food are now at home in a special game preserve in the famous Neandertal, the valley of the little river Neander where the bones of the beetle-browed race were first found in 1856. Dr. Richard Rein of Dusseldorf, who has long agitated the project, had the satisfaction recently of seeing the first wisent released in the enclosed area.

The animals now in the preserve include several wisent, or European bison, herds of fallow deer, red deer and reindeer, and a small herd of wild horses. The latter animals, similar in size and shape and color to the wild horses pictured on cave walls in France and Spain, are from the herd kept by the Duke of Croy-Dulmen, in Westphalia. It is proposed also to introduce moose, chamois and ibex, all of which were included in the meat menu of cavemen. No artificial shelter is provided, but the animals appear to thrive perfectly well in all weathers, finding natural shelter in the woods.

Of special interest is the effort to increase the number of wisent. Pure-blooded animals of this species now number less than 100 head in all Europe, and efforts are being made to increase the stock by breeding. At the same time a type of cross-breeding known as *Verdrängungszucht,* or elimination breeding, is being carried on with American bison cows. A wisent bull is bred to the bison cow. Only female calves are saved. These hybrids are again bred back to pure-blood wisent bulls. Thus each generation will have less bison and more wisent blood, and in the end the animals will be practically pure-blood wisent. This method, in use elsewhere in Germany, is also being followed at the Neandertal preserve.

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SEISMOLOGY

Earthquake Near Japan Followed by Aftershocks

A SEVERE earthquake shook the ocean bottom near the northern end of the Japanese archipelago on Sunday, Feb. 21, at 2:03 a.m., eastern standard time. It was followed by two sharp aftershocks. The epicenter was in latitude 45 degrees north, longitude 148 degrees east. Data on the quake were computed by seismologists of the U.S. Coast and Geodetic Survey, from telegraphic messages transmitted through Science Service.

Stations reporting included the private observatory of Mrs. M. M. Seeburger, Des Moines; the University of Montana, Butte; Pennsylvania State College; the University of Wisconsin; the observatories of the Jesuit Seismological Association at Georgetown University, Fordham University, Canisius College, and St. Louis University; the observatories of the U.S. Coast and Geodetic Survey at Tucson, Ariz., Sitka, and Honolulu; and the seismological observatories at Manila, P. I., and Phulien, China.

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IN SCIE

RADIO

Newest Invention Improves Human Voice on the Radio

EDITORS edit the news. So far, broadcasters, movie and record makers could only audit, not edit, the human voice. Because they could not edit, they cast off singers and actors whose voices fail to pass the audition test.

Hope for the cast-offs may lie in U.S. Patent No. 2,064,305, just granted to John Hays Hammond, Jr., son of the famous civil engineer, holder of some 400 patents.

His latest invention is an electrical voice editor. On movie film sound track or phonograph disc, it records only the most pleasing qualities in the artist's voice. It suppresses the unpleasant squawks, thereby making a bad voice sound better; possibly good.

Main works of the voice editor are a plurality of parallel electrical paths between the microphone and recording instrument. Each path has a filter which filters out unpleasant qualities in the particular type voice for which it is designed.

Thus, when broadcasting or recording, baritone Smith's voice would pass through a filter specially designed to make his voice sound pleasant. When songstress Brown started performing before the microphone, the control man would cut out Smith's filter and switch in the one that beautifies her voice.

Science News Letter, March 6, 1937

CHEMISTRY

Artificial Pumice Made From Volcanic Glass

A RECENT German patent describes a method of making artificial pumice, states a report to the American Institute of Mining and Metallurgical Engineers. Volcanic glass (obsidian) is heated to 900 degrees centigrade and dropped down a shaft furnace. As it comes in contact with the rising hot gases the material swells and becomes porous. These bubbles are consolidated with lime or cement to form a material like natural pumice.

Science News Letter, March 6, 1937

NE FIELDS

PALEONTOLOGY

Barbecued Camel?—An Old American Dish

TRY ASKING for barbecued camel at a roadside refreshment stand some time, if you want a real, old-fashioned American dish.

You probably won't get it—no camels today. But 10,000 or maybe 20,000 years ago, when the earliest known Americans, called Folsom Men, were alive, you could have eaten camel steak with them, broiled over a blazing camp fire.

Paleontologists of the Smithsonian Institution have identified as "camel" some of the bones found by a Smithsonian expedition at the only known dwelling site of Folsom Men, in northern Colorado. Bison was another meat familiar to these oldest Americans.

Importance of the camel bones is this: the camel survived the Ice Age in North America for a short time, if at all. That Folsom hunters ate camel, therefore, is good evidence that human beings had already arrived in this country near the end of the Ice Age—a point much debated among America's prehistorians.

Science News Letter, March 6, 1937

SAFETY ENGINEERING

Drivers Who Fall Asleep Not Those Long on Road

WHENEVER the driver of an automobile falls asleep at the wheel long enough to cause an accident—and that is not very long—he will be lucky if he ever wakes up. A study of driver-asleep accidents in a dozen states reveals that one out of twelve kills somebody, and that one-third of the time it is the driver himself.

A surprising fact developed by the National Safety Council is that nearly half of the drivers who fell asleep had been driving for less than two hours. A third of them, however, had been without sleep for 16 to 20 hours, so that it is evident that lack of proper amounts of sleep rather than grueling grinds at the wheel is responsible for a large number of these mishaps. The drowsy driver returning home from a late party is the most common victim of the highway nap, and he usually drops asleep about two o'clock.

Like passenger-car drivers, truck operators often nap after only a short turn at the wheel, and the explanation lies in the same lack of sleep, 80 per cent of them having slept less than 7 or 8 hours in the past 24, and more having been without the normal 14 or 16 hours in the preceding 48. Truck drivers, however, are more apt to drop off at about 5 or 6 o'clock in the morning. Miscellaneous freight and furniture movers fell asleep more than any other class of truckers, and haulers of milk and petroleum products were widest awake.

Pedestrians need not worry too much about slumbering motorists because only 2 per cent of fatalities involved the innocent bystander. A case was found, however, of a pedestrian falling asleep himself, with fatal results.

Motorists who have a hard time keeping awake at the wheel should get off the road immediately. Otherwise they will have a harder time waking up.

Science News Letter, March 6, 1937

MEDICINE

Blowing on Cloth Makes Thermometer Run Up

BY JUST wrapping a piece of dry cloth about the bulb of a clinical thermometer and blowing hard upon it, a patient can manufacture evidence that he has a startlingly high fever.

Dr. Ona K. DeFoe has discovered this new trick that doctors must be alert for when encountering unusually high temperatures in their practice of medicine. In an explanation, (*Science*, Feb. 19) Dr. DeFoe of the St. Louis College of Pharmacy credits abnormally high temperatures for extended periods in usual cases to the use of heating pads or hot-water bottles, but suggests that the blowing method can achieve 106 to 108 degrees Fahrenheit, usually the limit for clinical thermometers.

An explanation of why the blowing causes the temperature rise was given by Dr. F. E. Poindexter of St. Louis University. The water vapor in the breath is absorbed by the fibers of the cloth and the heat of adsorption causes the rise in temperature. Adsorption is not the same as absorption. In adsorption the material is drawn tightly to the surface while in absorption the material is drawn within the absorbing body.

Science News Letter, March 6, 1937

PSYCHIATRY

Fairy Tales Told Children Blamed for Later Ills

MENTAL and emotional troubles of adults can often be traced to the fairy tales told them in childhood. Cases of this kind were reported and explained by Dr. Sandor Lorand of New York City, at the meeting of the American Orthropsychiatric Association.

Dr. Lorand does not, however, ban all fairy tales. Sometimes these stories told to amuse children can help the child solve some of his problems and make growing up a less difficult process.

The way the story is told to the child is as important as the story itself, it appears from Dr. Lorand's discussion. If a child is excited by the story, some outlet for this excitement should be provided or otherwise the suspended excitement may arouse fears that hamper him all his life. Acting out the story and solving the problems it suggests will help to dissipate the excitement.

"Other considerations," Dr. Lorand said, "have yet to be worked out in this connection: as, what prompts parents to choose the stories they tell. The elements in fairy tales that adults enjoy is also a subject well worth further study; as is the question of precisely what the adults themselves are acting out in telling the stories or in listening to their own voices. For there unquestionably is an adult attitude to these fairy tales. Although at present considered exclusively children's fare, they have grown out of genuine folk-lore material, which has not come down to us through the generations with the sole purpose of amusing children. On the contrary, folk tales deal primarily with the problems of adults. As folk-lore originally had a social aspect beside that of entertainment, so fairy tales now told to children are supposed to socialize them through entertainment."

Science News Letter, March 6, 1937

ENGINEERING

Concrete Lumber For Fireproofing

CONCRETE lumber is now being used for fireproof construction, reports Oliver Bowles of the U. S. Bureau of Mines. One-inch boards are coated with firmly-bonded concrete. It is used for ceilings, floors, roofs and partitions. When applied to a steel frame a fireproof frame house may be built.

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From Page 151

The type of technical innovation most likely to benefit the economic system is that which is directed to the manufacture of an entirely new commodity or service which creates a net increase in wealth, making use of the idle factors of production which under our complicated industrial structure we have not learned to properly apply. Autos, radio, sound pictures and airplanes fall in this category of goods, constituting a type of technical progress which makes new employment and higher living standards. When the far-reaching influence of motor transport is considered in this connection it will be understood that it is machinery which creates a new and useful product and a net increased demand with a decreasing group of technologically unemployed.

Not New

Technological unemployment is not a new economic phenomenon, but it has become of very considerable significance with the more rapid rate of technical change and with the multiplying complexity of our industrial structure. We blame the machines which have created such amazing volumes of goods, although it is our own inability to use them properly, as well as certain other factors in our economy, which underlie our difficulties. The total supply of labor, for example, is inelastic and cannot be altered in quantity to fit the varying needs of production. When the demand for labor falls off, the original supply remains. Moreover, it is immobile, neither shifting readily from one type of skill to another nor among different geographical regions. And because the market for labor is unknown to the laborer, he is unable to find new employment, even though such may exist, without going through a period of readjustment, or unemployment.

Finally, it should be noted that modern industry has spent practically the total of its efforts planning and perfecting its methods of production without regard for the needs of the markets as a whole. We expect the problems of distribution to care for themselves, and hope for order instead of planning it. To blame the machine for our own shortcomings is to cloud the issues that we should be facing.

Welding, a new occupation not possible to hand labor, is illustrated on the front cover of this week's SCIENCE NEWS LETTER in a photograph from the Lincoln Electric Company.

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SENSITIVE FINGERPRINT METHOD

Fingerprints left by kidnapers and other criminals are sometimes too faint to be "developed" by means of the present dusting process. Dr. Francis F. Lucas, working in the Bell Telephone Laboratories, makes them show up in bold black lines by a trick he learned from biologists. Fingerprints consist largely of oily or fatty material from the skin. Oils and fats are turned black by exposure to fumes of osmic and chromic acids in a preparation known as Flemming's reagent. Then the paper or other material bearing the print is washed with a dye that shines blue-green under ultraviolet rays. Examined with a magnifier or photographed with an enlarging camera, the faintest of prints is made to "stick out like a sore thumb." If they are on printed or handwritten paper, the ink lines can be cut out of the picture by suitable manipulation of the ultraviolet radiation and the use of light filters, leaving only the fingerprints showing black against their glowing background.

BIOCHEMISTRY

Animal Disease Now Linked To Non-Living Protein

FIRST indication that an animal disease may be caused by protein molecules, non-living bits of matter that grow much as though they were living germs, is contained in studies reported by Drs. J. W. Beard and Ralph W. G. Wyckoff of the Rockefeller Institute for Medical Research laboratories (*Science*, Feb. 19).

From warty masses that occur on western cottontail rabbits and are considered to be virus-induced, the experimenters isolated a high-molecular protein with which is associated the infectiousness of the disease. These warts are known as papillomas and are epithelial tumors.

Recently Dr. W. M. Stanley, also of the Rockefeller laboratories, startled the scientific world by demonstrating that a crystalline protein obtained from the juice of tobacco plants with mosaic virus disease is the agent responsible for the disease. This won him the $1,000 prize of the American Association for the Advancement of Science.

The work of Drs. Beard and Wyckoff extends this research to viruses that cause animal ills. The protein molecules were separated by whirling the wart extracts in a centrifuge with a field of 60,000 times gravity. It is estimated that the molecular weight of the protein extracted is in excess of 20,000,000, which would make it the heaviest known to science.

PSYCHOLOGY

Don't Send Bad Boys To Principal's Office

Conference Discusses the Part of Schools and Homes In Care For Abnormal and Handicapped Children

BAD BOY Bobby may no longer be marched off to the principal's office for punishment if and when the public schools adopt suggestions made to a Conference on the Exceptional Child by Dr. John E. Bentley, psychologist of American University.

Such an indignity to the unruly child, Dr. Bentley called "medievalism." A much better way is to be found in the Child Guidance Clinic which should care for the health, behavior, and achievement of the pupils, Dr. Bentley believes.

"Many children fail, and develop adverse behavior personalities not because they are irrational, mentally inferior, or intellectually disabled but because they have never been recognized as faulty learners," he said. "They need the careful appraisal and help of psychological service that will seek to remedy their erroneous reactions.

"To cast children who fail, children who are acclaimed to be behavior problems on the scholastic scrapheap as inefficient, inferior, and beyond hope before they have been examined is socially criminal; and society must pay ultimately the price of this educational and social folly."

Unwanted Children

The unwanted child, and the baby who feels for some reason or other that he is not loved, are likely later to swell the pathetic ranks of the neurotic and the juvenile-delinquent. So Dr. Winifred Richmond, of St. Elizabeth's Hospital, told the Conference in explaining the part that the family can play in helping the abnormal child.

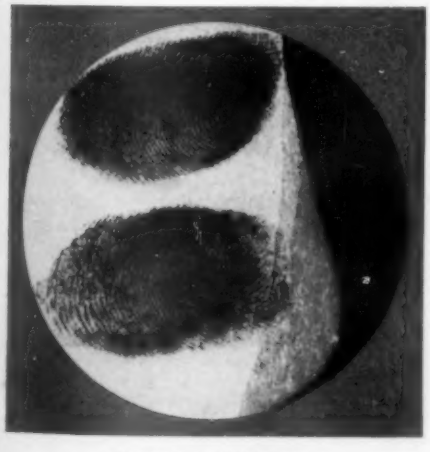
Children need love, she said. When deprived of it, one type of individual may develop nervous habits and another may become delinquent.

"Undoubtedly there are many children who make an adjustment which enables them to develop without becoming either ill or delinquent, and there may be other causes in the development of nervous conditions in a child; but nearly all authorities agree that some disturbance in the normal love relationships is the most frequently found," Dr. Richmond said.

"It has been argued the small size of the modern family results in too intense love being centered upon the children, and parents and children are too closely associated, so that opportunities for friction are increased, and the parents' unhappiness and unhealthy attitudes can scarcely fail to react upon the child. In a culture like the Samoan, where the child is a member of a large kinship group, and cared for from the beginning by half a dozen different persons, given love abundantly but not intensively by any one person, he develops without any strong attachments but seldom indeed does he show any nervous tendencies.

"On the other hand, each of us has only a certain capacity for loving, some being much more limited than others. In a large family the mother may not have love enough to go around, so to speak, and some of the children are bound to feel themselves neglected."

Parents of physically handicapped



MADE VISIBLE

These fingerprints were made to show up so that they could be studied and photographed by Dr. Lucas's method described on the facing page.

Should have big future, says scientist

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children or those with brain injuries or speech defects were warned by Dr. Richmond to accept their children for what they are and not to try to force them to meet the standards that might be expected of those not so handicapped. If encouraged to make the best of what they have with no regrets for what they lack, these handicapped children may turn out very well indeed, she indicated.

Science News Letter, March 6, 1937

GENERAL SCIENCE

More Diffusion of Science Predicted by Foundation Head

Laboratories and Study Collections Should Be Opened To Adult Public; Science Material Should Go on Road

PREDICTING that we are now entering a period of greatly increased interest in the spread of new knowledge and the fruits of recent research and discovery, Dr. F. P. Keppel, president of the Carnegie Corporation of New York, addressing the American Philosophical Society, suggested a widespread effort to provide educational opportunities for adults in the fields of science.

Science is a neglected field in adult education, Dr. Keppel said, even though our civilization is "based to a degree unimaginable in the past upon the applications of science."

Dr. Keppel visualized the resources of educational and scientific America made available not alone to the children and youth in schools and universities, but to the grown-ups.

"Institutions must open their doors," he said, "and in particular more colleges and high schools must throw open their laboratories and study collections. For use in communities where it is not now available, we must have suitable science material 'on the road' just as we have our traveling exhibitions of pictures and our traveling orchestras."

One liability in the proposed program is what Dr. Keppel described as "a curious shyness on the part of our males about being caught at improving themselves culturally." Until recently, adult education in the fine arts represented "what the geneticists would call a sex-linked character."

The American Philosophical Society, founded by Benjamin Franklin and now implemented by the Penrose bequest, could take a leading part in this proposed movement to make science more widely understood and appreciated, Dr. Keppel suggested.

"A few years ago the fact that in the United States the spirit of intellectual inquiry is free would have been taken for granted," Dr. Keppel observed. "But today our relative freedom, despite Scopes trials and teachers' oaths, must be reckoned as a very precious asset. If we look overseas, certain countries which have made great contributions to the advancement of learning in the past appear to us to be in the process of committing mental suicide. This is, let us hope, an appearance and not a reality, but at the best they seem to be in for a considerable period of intellectual hibernation."

One serious liability in diffusing science more adequately, Dr. Keppel said, is the traditional attitude of so many men of science, the very men who should be leaders, not only in the advancement but in the diffusion of knowledge.

"Most of those who are themselves advancing the frontiers of scientific knowledge are frankly not interested in the popular diffusion of such knowledge," he said. "When approached upon the subject, they are likely to reveal a fear that if it were known by their scientific colleagues that they were developing such an interest, they would lose face, and this despite excellent examples to the contrary to be found in England and elsewhere.

"Certain other leaders point out that the unevenness of preparation in any adult group adds enormously to the difficulties of laying any solid foundation of fact upon which a structure of worth while understanding can be erected by the individual. This liability deserves serious consideration. If it is proposed merely to carry over the classroom techniques based upon uniformity of previous preparation, one can well understand the doubts and fears of these leaders. We do know, however, that excellent results are actually being obtained when instruction is individualized, and more important when the adviser has skillfully limited the student's own objective to a degree of understanding which his factual structure can safely carry.

"Even when the leaders in science are willing to talk to the laymen about these matters, it often develops that the two groups are not talking about the same thing. What the scientist has in mind is a broader spread throughout the American people of a belief in the importance of science and of the scientific method in modern life. Now this is admittedly more desirable. Indeed it is hardly reasonable to expect that in the long run funds will be forthcoming for the support of scientific research in adequate amount from taxation and corporate or private sources, unless there is developed a more general understanding of the objectives of science on the part of the public.

"But surely this is not the whole story. Hasn't the individual American adult a right not merely to worship, but to learn, and in learning will he not only enrich his own life, but help the course of public appreciation in the most effective possible way?"

Science News Letter, March 6, 1937

● RADIO

March 9, 5:15 p.m., E.S.T.

EGYPTIAN TOMB DISCOVERIES—Ambrose Lansing of the Metropolitan Museum of Art.

March 16, 5:15 p.m., E.S.T.

OUR PREHISTORIC ANCESTORS—Edgar B. Howard of the Philadelphia Academy of Natural Sciences.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

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PLANT GEOGRAPHY

NATURE RAMBLINGS

by Frank Thone

Houses Divided

FAMILY resemblances sometimes persist even though the families are long divided.

You may have among your own acquaintances a pair of cousins of about the same age whom strangers will mistake for twins. Such cases are not particularly rare, even in kinships that have long lived apart.

Even more striking are the "twin cousin" species of plants that can be found on opposite sides of the Atlantic. Prof. M. Victorin of the University of Montreal has pointed out a number of such almost identical paired species that still persist, though the last land bridge that connected Europe and North America, making the boreal flora a continuous unity, vanished during Tertiary time, a good many millions of years ago.

Among trees, Prof. Victorin pairs off the famous English elm with the slippery elm of this continent, the graceful American or white elm with a similarly shaped tree native to Continental Europe, our eastern white pine with the Balkan pine, the Scotch pine with our jack pine. Among smaller trees, perhaps less known to non-botanists, there is an even more strikingly close resemblance between the American and European species of ironwood. Prof. Victorin remarks, "The segregation is so slight that the two might be regarded as conspecific, according to certain standards."

Prof. Victorin's favorite botanizing ground is the Gaspé peninsula and adjoining areas, near the mouth of the St. Lawrence River. In this region, nearest to Europe of all American lands really hospitable to a rich and varied development of plant life, he has found several genuinely European species that do not occur elsewhere in North America at all. Notable is one kind of sedge, that grows only in limited shoreward areas on Newfoundland and Anticosti Island.

In striking contrast to these conservative cousinships of the old, undisturbed regions, where long-continued stability of environmental factors may be presumed to encourage persistence *in statu quo,* are the settled lands farther up the river, where human colonization came early and where the land has been cleared of its primeval forest and cultivated for two centuries and more. Here, the revolution wrought by ax and fire, plowing and grazing, has seemingly offered freer opportunity for the deployment of new evolutionary forms. Very striking is the wide range of species or varieties in the hawthorn, a shrub of pasturelands and semi-open country that had no chance at all in the old, tightly closed forest.

Prof. Victorin expresses the view that "the critical study of the flora of northeastern America has undoubtedly supplied fresh evidence that vegetable life continues a development initiated very long ago, that new systematic entities, species and varieties, are actually in the making."

Science News Letter, March 6, 1937

MEDICINE-ECOLOGY

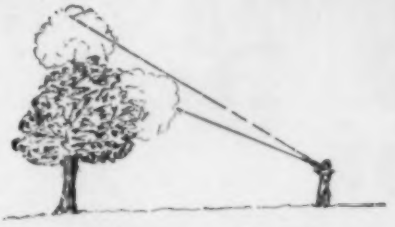
Spring Floods May Bring Late Summer Sneezes

WILL there be a greater-than-normal amount of hayfever in the Ohio Valley flood area this summer?

Possible connection between floods and sneezes seems fairly reasonable on theoretical grounds at least, as a corrollary to a thesis recently advanced by a New York pollen specialist, Dr. R. P. Wodehouse. (*See SNL,* Feb. 27.) The ragweeds, chief causes of hayfever, follow the plow and the scraper, he pointed out; they are first and foremost weeds of the newly disturbed soil left by agricultural and engineering operations.

Dr. Wodehouse did not mention the thick deposits of fresh alluvium left on river bottoms by receding floods, but these also are first-order breeding grounds for ragweeds, particularly the tall ragweed. Anybody who has ever tramped river bottom lands in the Midwest will remember their towering thickets, with tall shafts running up like the spears of Alexander's famous phalanx.

Vast areas of lowland have been overswept by the recent flood, and the



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deposits of mud left behind will smother much of the natural vegetation that held it. Other stretches were severely eroded, and the surface vegetation taken away along with the surface soil. Into these bare patches the tall ragweed armies can be expected to march.

Some of the denuded areas, in the country, will of course be seized upon, plowed and planted. But there are considerable empty areas in even more critical places, in the waste lands that fringe the industrial districts and railroad yards of every important city. In the river-deposited mud of these neglected lands the ragweed will flourish as no green bay tree ever dreamed of doing—and their pollen will be launched in greatest concentration just where it will do the most mischief.

There are two flood-caused classes of supplementary areas that will be open to ragweed invasion. Where levees were breached, there will be new mounds of loose earth. Unless these are sodded down immediately they will of course be fair ground for weed competition—and ragweed always wins in that kind of beggars' battle. City dumps, also, are receiving immense quantities of muck, left behind by the flood in city streets and homes and workplaces and shoveled into dump trucks and railroad cars as the first cleanup task. This also is meat for the ragweeds.

It might be a good politico-medical idea to make pollen-sensitiveness a necessary qualification for municipal public office. A sneezing city council would not hesitate long over a proposal to arm relief workers with scythes and send them forth to do battle against the ragweed phalanxes.

Science News Letter, March 6, 1937

PHILOSOPHY

Free Will Doctrine Advanced By Professor Max Planck

FREE WILL versus determinism or foreordination, old, old riddle that has been a wit-racker to theologians and philosophers in past generations, crops up anew as a source of controversy and discussion, this time in the mouths of scientists. Ironically, too, the new antagonism against the notion of a cosmos completely and relentlessly regimented by exceptionless natural laws comes from the intellectual descendants of the very group of scientists who first forged the seemingly unbreakable iron ring of such laws, the physicists.

Newest voice of challenge to the long-established doctrine of unescapable determinism is that of Prof. Max Planck, Berlin University's Nobel prizeman. He presents a brief but closely reasoned and carefully worded inquiry into the ancient question, from the point of view of modern physics. (*Forschungen und Fortschritte,* June 10.)

His central point is that the laws of physics are iron and immutable in the outside world of observable phenomena, where no kind of will is exercised at all. Here, the observer who knows the rules of the particular game of events going on before him, and who is careful also not to stick an interfering finger into the natural sequence of those events, can confidently predict their outcome.

But if the same observer tries to split himself in two, as it were, in an endeavor to stand aside and watch his own mental machinery grinding out a decision, he inevitably meets frustration. He may have the most intimate objective knowledge of the various forces and considerations pitted against each other and interacting toward the final choice, yet:

Will is Sovereign

"The will indeed permits itself to be influenced by the intellect, but never to be completely dominated. No matter how deeply one's intellectual insight may penetrate into the obscurity of one's own will-motives, at the decision the will is sovereign and gives the final stroke independently of the intellect. Nevertheless, the will of each person, like his character, remains strictly causally conditioned."

Summarizing, Prof. Planck continues: "From without, looked at objectively, the will is causally bound; from within, looked at subjectively, the will is free. No matter how exact is one's self-knowledge, it is impossible to deduce, by purely intellectual methods based on present circumstances and the influences of the environment, a knowledge of one's own future voluntary conduct."

Prof. Planck extends his conclusion from the individual will to the will of communities and nations: "The history of a people is comprehensible on a causality basis only as regards the past; its future on the contrary can never be understood in a purely scientific manner. Hence it is fundamentally fallacious, to attempt to solve the question of decline or advance through scientific research alone. The future blossoms only for that people which applies and activates its will."

Science News Letter, March 6, 1937

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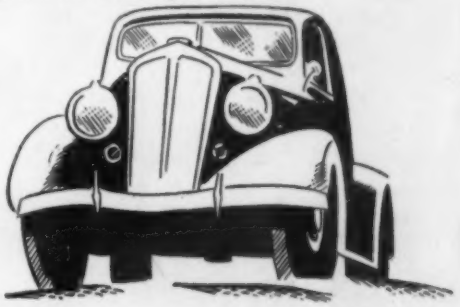
HEYWOOD BROUN—Well known columnist and a director of Consumers Union.
DR. MAX TRUMPER—Consultant in clinical chemistry and industrial toxicology.
MARION S. VAN LIEW—Home Economics Education Bureau, University of New York.
DR. ABRAHAM GOLDFORB—Secretary, American Society of Experimental Biology and Medicine.
DR. ALVIN JOHNSON—Director, New School for Social Research.
PROF. ROBERT S. LYND—Department of Educational Sociology, Columbia.
EVELYN PRESTON—President, League of Women Shoppers.

Competent, *unbiased* technicians, either on the staff of Consumers Union or employed as consultants, working in university and other laboratories, make the analyses and determine the ratings by means of laboratory and other standard tests, the results of which are painstakingly checked and verified. Products reported on include most of the merchandise you have occasion to buy from day to day: shoes, toothpaste, radios, foods, drugs, cosmetics, vacuum cleaners, soaps, liquors, clothing, tires, oils, and many things besides. Notes are also included in the *Reports* on the labor conditions under which many of the products are manufactured.

Consumers Union has no connection with any commercial interests. Its income is derived solely from membership fees and contributions and is used solely in the interests of its members. The membership fee (which confers voting rights) is $3 a year. It includes twelve issues of the monthly *Reports* and a yearly Buying Guide (the 1937 edition of this Guide, running to nearly 200 pages, is now in preparation). An abridged edition of the *Reports*, covering only the less expensive products, is also available at $1 a year.

To become a member of Consumers Union, mail the application form below. Your membership will begin either with the forthcoming March issue or with any previous issue you may indicate. Listings of the principal subjects covered in past issues are given in the coupon below.

Ratings of 1937 Cars



Divided into three price classifications under $1,000, over twenty-five leading models of 1937 automobiles are rated in the current March issue of *Consumers Union Reports*—some as "Best Buys," some as "Not Acceptable," and others as "Also Acceptable" in the estimated order of their merit. Based on such factors as economy, comparative safety of operation, general performance and other engineering features, these ratings were made by competent automotive engineers after thorough examinations and actual economy tests. Such features as hypoid gears, automatic choke, frame durability, driver-visibility, and others are discussed at length. Tables on comparative gas consumption are also given. This report—which should be read by everyone contemplating the purchase of a new car—will be followed in an enrly issue by ratings of cars in higher-priced groups. Previous issues of the REPORTS (still available) have analyzed and rated tires, gasolines, motor oils, and anti-freeze solutions.

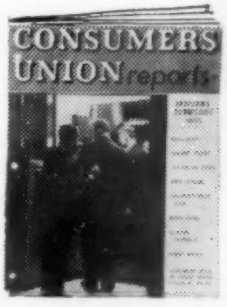
Also discussed in the March issue are the following products: RADIO SETS, FLOUR, SHEETS, CANNED ASPARAGUS and CHERRIES.

SOME OF THE CARS RATED IN THIS ISSUE

WILLYS	FORD	CHRYSLER
CHEVROLET	BUICK	DODGE
PLYMOUTH	STUDEBAKER	DE SOTO

Begin My Membership with Issue Checked

- ☐ MAY—Toilet Soaps, Breakfast Cereals, Milk.
- ☐ JUNE—Automobiles, Gasolines, Seeds.
- ☐ JULY—Refrigerators, Used Cars, Motor Oils.
- ☐ AUG.—Oil Burners and Stokers, Hosiery, Blacklist of Drugs and Cosmetics, Meat.
- ☐ SEPT.—Shoes, Tires, Whiskies, Women's Coats.
- ☐ OCT.—Men's Shirts, Gins, Electric Razors, Dentifrices, Anti-freeze Solutions.
- ☐ NOV.—Radios, Toasters, Wines, Children's Shoes, Winter Oils.
- ☐ DEC.—Vacuum Cleaners, Fountain Pens, Electric Irons, Blankets, Nose Drops.
- ☐ JAN.-FEB.—Men's Suits, Cold Remedies, Shaving Creams, Children's Undergarments.
- ☐ MAR.—1937 Autos, Radio Sets, Sheets, Flour, Canned Foods.



To: CONSUMERS UNION OF U. S., Inc., 55 Vandam St., New York

I hereby apply for membership in Consumers Union. I enclose:

- ☐ $3 for one year's membership, $2.50 of which is for a year's subscription to the complete edition of *Consumers Union Reports*.
- ☐ $1 for one year's membership, 50c of which is for a year's subscription to the abridged edition of *Consumers Union Reports*. (Note: Reports on higher-priced products are not in this edition.)

I agree to keep confidential all material sent to me which is so designated.

Signature .....

Address .....

City and State .....Occupation .....LM

•First Glances at New Books

Animal Psychology

A FRIEND IN THE DARK, THE STORY OF A "SEEING EYE" DOG—Ruth Adams Knight—*Grosset & Dunlap,* 65 p., illus., $1. The mutual training of guide dogs and the sightless people they lead, told in semi-narrative form; most attractively illustrated. Whether you know a blind person or not, if you like dogs you will find this book interesting.

Science News Letter, March 6, 1937

Medicine

CARCINOMA OF THE FEMALE GENITAL ORGANS—M. C. Malinowsky and E. Quater; translated from the Russian by A. S. Schwartzmann—*Bruce Humphries,* 255 p., illus., $5. Eleven chapters on various phases of the subject by Professors N. N. Anitschkow, W. J. Talalaew, E. I. Quater, M. S. Malinowsky, W. S. Grusdew, B. A. Archangelsky, M. G. Kuschnir, S. I. Spassokukozky, Dr. Th. J. Pojarissky and Privat-Dozent J. E. Gittelson.

Science News Letter, March 6, 1937

Bacteriology

FUNDAMENTALS OF BACTERIOLOGY—Martin Frobisher—*Saunders,* 474 p., illus., $3.25. By an associate in bacteriology at Johns Hopkins University who is also director of laboratories, The Eastern Health District, Baltimore. The writer assumes that students permitted to study bacteriology will be adequately prepared in physics and chemistry, as well as in elementary biology.

Science News Letter, March 6, 1937

Herpetology

SNAKES AND THEIR WAYS—C. H. Curran and Carl Kauffeld—*Harper,* 285 p., illus., $3.50. Where snakes live and how; fangs, venoms, and their use; snake stories and sea-serpent yarns; information and entertainment combined. The illustrations are abundant and of uniformly high quality. A valuable feature is a checklist of the snakes of the United States and Canada, with habitat annotations.

Science News Letter, March 6, 1937

Geology

THE GEOLOGY OF MOUNT RAINIER NATIONAL PARK—Howard A. Coombs—*Univ. of Washington,* 212 p., illus., maps, 75c. Field scientists are coming more and more to choose our national parks as places for study, both by themselves and their classes. Dr. Coombs' brochure, which is quite candidly designed for persons directly interested in geology and not for the tourist trade, will undoubtedly find wide usefulness with its chosen audience. The halftone figures of mineralogical photomicrographs are particularly commendable.

Science News Letter, March 6, 1937

Mycology

THREE THOUSAND MYCOLOGICAL TERMS — Walter H. Snell—*Rhode Island Botanical Club,* 151 p., illus., $2. Botanists generally, and mycologists particularly, will welcome this extensive glossary of the special vocabulary needed by those who would understand fungi. The definitions are very brief but quite adequate.

Science News Letter, March 6, 1937

Horticulture

VINES FOR EVERY GARDEN—Dorothy H. Jenkins—*Doubleday,* 95 p., $1. Trees, shrubs, perennials, annuals, all have had thorough discussion in book after book; vines have been rather neglected—strange, too, considering how indispensable they are to a well-gardened home place. Miss Jenkins here supplies the lack, in a small but comprehensive book full of practical suggestions.

Science News Letter, March 6, 1937

Zoology

ON JUNGLE TRAILS—Frank Buck—*World,* 280 p., illus., 96c. Frank Buck's "bring 'em back alive" stories are of the kind that boys (and a good many girls, too), "eat up alive." Here is a collection of them, suitably arranged for school use.

Science News Letter, March 6, 1937

Psychology

MEASUREMENT IN PSYCHOLOGY—Thelma Hunt—*Prentice-Hall,* 471 p., $3. A summary of the whole field of different types of mental testing intended as a textbook for college students.

Science News Letter, March 6, 1937

Marine Biology

SEASHORE LIFE—Harrington Wells—*Wagner,* 271 p., illus., $1.25. A well-illustrated book for younger readers, telling its story in simple terms but not "denatured." Designed primarily for use on the Pacific coast of the United States, but contains a wealth of material that is valid wherever salt water meets sand or rock.

Science News Letter, March 6, 1937

Geography

POLISH COUNTRYSIDES, PHOTOGRAPHS AND NARRATIVE—Louise A. Boyd, with a contribution by Stanislaw Gorzuchowski—*American Geographical Society,* 235 p., illus., $4. How the people live in the rural districts of Poland (and that means most of the country), how they raise and harvest their crops, how they travel, what manner of houses they live in, where they go to church on Sunday—the whole story of a land and its people presented in scholarly yet thoroughly interesting fashion. There are over a hundred solid pages of excellent photographic illustrations, and scores more of pictures scattered through the text.

Science News Letter, March 6, 1937

Physics

MECHANICS, MOLECULAR PHYSICS, HEAT, AND SOUND—Robert Andrews Millikan, Duane Roller, and Earnest Charles Watson—*Ginn,* 498 p., illus., $4. This book, which started off to be merely a revision of Prof. Millikan's text on these subjects, has turned out to be a much more comprehensive and profound text for serious students who are majoring in science or engineering.

Science News Letter, March 6, 1937

Natural History

HAPPY NATURE ADVENTURES—Mary C. Butler—*Dorrance,* 113 p., $1.50. Easily flowing essays, with many personal narrative touches, about a variety of outdoor subjects, ranging from warblers and bobwhites to tall trees and high rocks.

Science News Letter, March 6, 1937

Medicine

GREEK MEDICINE—Fred B. Lund—*Hoeber,* 161 p., $2. Another interesting addition to the *Clio Medica* series.

Science News Letter, March 6, 1937

Ornithology

BIRDS ASHORE AND A-FORESHORE—Patrick Chalmers—*Collins,* 180 p., colored plates, $7.50. A beautiful book about British birds, that many on this side of the Atlantic will want to own. The text, discursive, anecdotal, breaks into verse at the slightest provocation. The plates are such as Fuertes might have been willing to claim as his own—and higher praise than that an American cannot give to a bird picture. All round, as fine a book for bird-lovers as has appeared in a long time.

Science News Letter, March 6, 1937